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U. S. DEPARTMENT OF AGRICULTURE

the Pattern of World Milk Production

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Acknowledgment

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Preface

The export market for dairy products of the United States has assumed an increasing significance. Our production of milk and milk products has been continuing at a rate in excess of demand at the prices resulting under the support program. The economic surpluses of dairy products have given rise to relatively large Government-owned inventories, which place a heavy burden upon the Government's price suppport operations.

The Government has been attempting to dispose of these surpluses in several ways. Much of the surplus has been distributed through our own school-lunch program and relief and disaster feeding programs, and some through emergency and relief feeding operations in foreign countries. In addition, the Government has provided for private trading in surplus products in the world's markets at competitive prices. And, most recently, it enacted the Agricultural Trade Development and Assistance Act of 1954, which provides for the selling of agricultural surpluses in foreign markets for local currencies, the proceeds to be used for such purposes as promoting new markets for agricultural products, purchases of strategic materials for the common defense, and international economic development as well as financing international educational exchange programs.

In considering the world market for dairy products, we find that it has been an extremely limited one, with the United Kingdom accounting for two-thirds of the world's imports of butter, more than one-half of the cheese, and one-seventh of the processed milk; furthermore, the United Kingdom has long been supplied in large part under special bulk contracts. The markets the United States—historically a net importer of milk and milk products—has to seek are primarily in the milk-deficit areas, where the United States could, to quote from a policy statement by President Eisenhower, "utilize its agricultural surpluses to increase consumption in those areas where there is demonstrable underconsumption and where practical opportunities for increased consumption exist or can be developed in a constructive manner."

To determine these areas of demonstrable underconsumption and opportunities for increased consumption of dairy products requires first of all a knowledge of the world's production of milk. But in surveying the field, the Foreign Agricultural Service noted that huge gaps existed in production data and found that no concise country-by-country picture of production had ever been developed. Thus, it began the project of putting this information together, and the results are now presented in this report. We hope that this step to help seek out markets for milk products not only will benefit the American dairy farmer but will be useful as a work of reference as well.

This is not to say that the work represents a final study. All of the data are, of course, estimates. Some are official, having been made, as in the United States, under strict statistical procedures; others are official estimates obtained under less exacting standards. Some are unofficial estimates that have the sanction of the governments of the various countries. Still others are estimates of the author, estimates that have been reviewed by others and checked and rechecked. The figures for many of the countries listed should, therefore, be considered an approximation only. Data for 1953 were used because they are the latest available, but milk production changes so slightly from year to year that 1953 figures substantially represent current output.

The Pattern of World Milk Production

By TERRENCE W. McCABE*

The world is producing only enough milk to give each person 1 quart every 3 days—only enough to meet 60 percent of the minimum dietary needs. Those were the figures in 1953; they probably differ little in 1955.

In 1953, total milk production, assuming equitable distribution, would have had to be 985 billion pounds to allow each person his minimum dietary requirement of 400 pounds of milk annually. Actually, it was only about three-fifths of that—600 billion pounds.

Equitable distribution, however, does not exist. In New Zealand, for instance, each person's share of production is nearly 6,000 pounds a year; but in Korea it is less than a pound. Between these two extremes range all the other countries of the world: those in temperate climates, which contain only 40 percent of the population and produce 85 percent of the milk, average more than 500 pounds; those in other areas, only about 60 pounds. Obviously, as far as milk is concerned, this is the world's problem—surpluses in some areas, shortages in others.

It is not the intention of this study to argue the merits of the contention that there can be no surpluses so long as there are people hungry for milk. Both the surplus and the hunger are real to those that each involves. Yet, because of the national organization of the world's economy, there is no commercial meeting ground for the two; certainly, if the total production of the United States, for example, cannot be moved in the domestic market at stipulated prices, it cannot be sold in poorer areas of the world at the same prices.

Furthermore, quite apart from the inability of the distributive system to put the surplus supplies of one country into the consumer channels of another is the fact that, in many countries, most people cannot afford to produce and consume milk. In still others, as May [1] points out, cultural beliefs affect the food habits of mankind more than bodily needs do.

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[1] May, Jacques M. THE GEOGRAPHY OF MILK, p. 18. Proceedings of the First World Congress for Milk Utilization. Dairy Industries Society, International. Washington. 1953.

Milk Derived From Many Animals

Milk for human consumption is obtained from many kinds of animals, but the largest part of the total milk supply in 1953 came as usual from the various kinds and types of domestic cattle (table 5, p. 28). Cow's milk makes up such a large part of the total available for human consumption that it has come to be what we think of when we say milk; in fact, the phrase "world milk production" is widely known as meaning the amount of cow's milk produced in the 20 or more principal dairying countries.

The fact that milk from other animals comprises only about 10 percent of the total supply does not mean that this other milk is not important. Much of it is produced in areas where cow's milk is not available. Milk cows thrive and produce best in the Temperate Zones. In fact, they can survive only with difficulty in some areas where other milk-producing animals are quite at home.

In the preparing of this report, effort was made to record separately the production of cow's milk from that of other animals, but in several instances the data reported have been for total milk produced; since most milk so reported is cow's milk, it has been so recorded here.

In Asia, especially in India and Pakistan, buffaloes are an important source of milk. There are buffaloes in Africa, the Middle East, and Europe—most of them descendents of the water buffalo of India—but they are not so generally exploited for milk as they might be.

TABLE 1.—*Average composition of milk, by type of animal* [1]

Animal	Water	Solids				
		Total	Fat	Sugar	Protein	Ash
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Cow	87.65	12.35	3.70	4.75	3.20	0.70
Goat	85.71	14.29	4.78	4.46	4.29	.76
Sheep	80.82	19.18	6.86	4.91	6.52	.89
Mare	90.78	9.22	1.21	5.67	1.99	.35
Donkey	90.12	9.88	1.37	6.19	1.85	.47
Buffalo	82.24	17.76	7.96	4.86	4.16	.78
Camel	87.13	12.87	2.87	5.39	3.87	.74
Llama	86.55	13.45	3.15	5.60	3.90	.80
Reindeer	62.00	38.00	23.64	2.50	10.44	1.42

[1] So far as is known, no data exist on the composition of milk from yak and yak crosses; only the fat content of the milk is known. V. V. Ivanova and I. M. Lyubinov report (in *Dairy Science Abstracts*, January 1952, London) that the fat yield of yaks ranged from 6.5 percent to 6.7 percent, while the yak-cattle crosses under examination gave milk with 5 percent fat.

Source: From various sources as reported in Dairy Industries Catalog, Milwaukee, Wis., 1954.

Copyright by *Saturday Evening Post*

Reindeer submit to milking only under duress. Reindeer milk is the only fresh milk available in the far North.

The water buffalo produces considerably less milk than the dairy cow; still it ranks high among other milk-producing animals. An annual production of 10,000 pounds for a buffalo is outstanding. But the fat content of buffalo milk is considerably higher than that of cow's milk (table 1)—a 9-percent fat content is not unusual—and 1 pound of buffalo milk is said to have the caloric value of 1.5 pounds of cow's milk.

Buffalo milk is used in fluid form around urban centers, but in other areas it is more generally consumed as khoa, a crudely prepared powdered milk, and as butter, ghee, and yogurt.

Goat's milk is probably produced and consumed in greater quantities than is realized. The goat has been aptly labeled "the poor man's cow," for it is capable of a relatively high yield of milk and is satisfied with the poorest fodder. A goat can exist and produce a respectable amount of milk on forage that would be completely unsuitable for the cow. At the same time, the goat has been integrated into such highly developed dairying industries as that of the United States, and the milk used extensively in infant and dietetic feeding.

Sheep's milk is an important item in the diet of many people, particularly in certain localities of the Middle East and Africa. In Europe, ewe's milk is essential to the production of world-renowned cheeses.

The yak (*bos grunniens*) is the milk producer in the mountainous regions of central Asia. It is a native there and admirably adapted to cold climates. It is an efficient forager, even up to very high altitudes, and will produce approximately 3 pounds of milk daily during a lactation period of not more than 5 months. The milk has a rather high fat content.

A yak hybrid, the Pien Niu, is also found in central Asia. It has a 6-month lactation period and can produce up to 6 pounds of milk a day.

Camels are also milked to some extent, in the deserts of the east, as are reindeer in the far north. Mares are occasionally milked by nomadic tribesmen. And donkey's milk is sometimes used to feed infants or the ill; in the Navanagar area of India, where there are a large number of donkeys, the milk is sometimes sold at retail.

World: surpluses and shortages

Overall picture

Milk for human consumption from all milk animals in 1953 totaled about 600 billion pounds and was produced in 141 countries of the world.

The range in estimated production was extremely great, dropping from 121.7 billion pounds in the United States, more than one-fifth of the world total, to a million pounds in several areas and even negligible quantities in some small Oceanic territories. Cow's milk comprised the largest part of the milk supply—approximately 90 percent of the total. With cow's milk predominating, the primary areas of production in the world were essentially those above the Tropic of Cancer and below the Tropic of Capricorn, the temperate climatic areas most conducive to the raising and maintenance of dairy cattle. These areas include Canada, Alaska, the United States, Uruguay, Argentina, and Chile, all of Europe, northern Africa from French Morocco across to Egypt, the Union of South Africa and South-West Africa, Australia and New Zealand, and Japan. China, although largely above the Tropic of Cancer, is not included, for little milk is produced or consumed there.

These temperate-climate countries have 40 percent of the world's population, yet they produced 85 percent of the world's milk supply. The tropical and subtropical areas, with all the rest of the population, produced less than 100 billion pounds of milk, almost half of which was produced in one country, India.

More than one-third of the total milk supply is produced in Western Europe (table 2). Many of the countries are small, but have intensive dairying activities. With the amount produced behind the Iron Curtain, Europe accounts for half of all the milk produced in the world.

TABLE 2.—*Estimated world milk production, by area, 1953*

Area	Cow's milk	Other milk	Total milk	Percent of world total
	Million pounds	*Million pounds*	*Million pounds*	*Percent*
Canada and United States	137, 960	177	138, 137	23. 0
Other North America	4, 892	375	5, 267	. 9
Caribbean	2, 119	82	2, 201	. 4
Western Europe	195, 867	6, 625	202, 492	33. 7
Eastern Europe (excluding U. S. S. R)	36, 644	2, 613	39, 257	6. 5
U. S. S. R	57, 000	25	57, 025	9. 5
Middle East	6, 290	7, 163	13, 453	2. 2
India	19, 963	22, 397	42, 360	7. 1
Other Asia	11, 222	10, 926	22, 148	3. 7
South America	29, 014	1, 304	30, 318	5. 1
Africa	16, 098	7, 490	23, 588	3. 9
Oceania	24, 136	----------	24, 136	4. 0
Total	541, 205	59, 177	600, 382	100. 0

Source: Compiled by Foreign Agricultural Service from official and unofficial data.

The North American Continent supplies almost one-fourth of the world's milk, with the bulk of its contribution coming from Canada and the United States.

India, with more than half of its milk output obtained from animals other than cows, contributes the next largest amount. That country and other Asian nations produce more than 10 percent of the total supply.

South America, Africa, and Oceania divide about equally among themselves approximately one-eighth of the world's production. Most of the milk produced in countries in this group is cow's milk; only in Africa is the output of milk from animals other than cows of any importance to world production.

Most of the rest of the milk is produced in the Middle East, primarily by animals other than cows. And the Caribbean area makes a very slight contribution to total production.

Intensity pattern

The 600 billion pounds of milk produced in 1953 in 141 countries supporting a population of 2,461.4 million people means a per capita supply of 244 pounds (table 3). This amounts to about 1 quart every 3 days for each person.

However, as has been pointed out, production was concentrated in the temperate areas; there it averaged more than 500 pounds per person. In the other, more heavily populated, areas of the world, it averaged only about 60 pounds.

Although Europe, the United States, and Canada were the largest sources of milk in 1953, none was the area of most intensive production. Oceania, with 1,788 pounds per person, had more than twice the production per capita of the United States and Canada, which ranked second in intensive production.

The intensiveness of milk production in Oceania stands out clearly when production and population figures for Oceania are compared with those for South America, other Asia, and Africa. For, although each of these areas produced about the same amount of milk as Oceania in 1953, Oceania's output was attained with a population one-fourteenth that of Africa, about a ninth that of South America, and a sixty-third that of other Asia.

As prominent as Oceania, but at the other end of the scale, in production per capita is other Asia, including China. For this area, with almost one-third of the world's population, produces only an estimated 26 pounds of milk per person annually (table 3).

South America produced 258 pounds for each person; and the Middle East, on the strength of its large production of milk of other animals, showed a per capita figure of 206 pounds. India, which obtains much of its production from milk buffaloes, produced 115 pounds per person, approximately the same as the figure registered in Africa.

The top production per capita figure was that for New Zealand, which in 1953 produced 5,874 pounds for each person.

New Zealand, is, of course, one of the principal dairy countries of the world. Dairying constitutes by far the most economic utilization of the

TABLE 3.—*Milk production per capita, by area, 1953*

Area	Total production	Population	Production per capita
	Million pounds	*Millions*	*Pounds*
Canada and United States	138, 137	174. 9	790
Other North America	5, 267	37. 7	140
Caribbean	2, 201	16. 9	130
Western Europe	202, 492	305. 9	662
Eastern Europe (excluding U. S. S. R.)	39, 257	88. 4	444
U. S. S. R.	57, 025	205. 0	278
Middle East	13, 453	65. 3	206
India	42, 360	367. 0	115
Other Asia	22, 148	858. 7	26
South America	30, 318	117. 7	258
Africa	23, 588	210. 4	112
Oceania	24, 136	13. 5	1, 788
World total or average	600, 382	2, 461. 4	244

Source: Compiled by Foreign Agricultural Service from official and unofficial data.

6.5 million acres of sown and cultivated pastures, from which comes the bulk of New Zealand's wealth from primary produce; furthermore, the net returns from dairying are higher than could be obtained from any other type of livestock farming there. While New Zealand's total production is only about 2 percent of the world's output, most of its milk finds its way into world trade; domestic consumption accounts for only one-quarter of its production.[2]

In sharp contrast to New Zealand are war-torn Korea, where per capita production in 1953 probably was less than one-half pound, and China, where it was less than two-thirds of a pound.

Europe: production ranks highest

Europe's output of 299 billion pounds of milk in 1953 placed that Continent at the head of the list of milk-producing areas (table 5). Production was largest in France and Western Germany but most intensive in Denmark. In fact, in production per capita, Denmark was exceeded in all the world only by New Zealand. In Denmark and in the other small countries of Europe with high per capita production, the dairy industry is dependent to a considerable degree upon imported feed. But their other livestock industries—swine raising in Denmark, for instance—have an important resource in the substantial supply of skim milk available for feed.

Ireland, which is next to Denmark in production per person, is somewhat of an anomaly in that its high rank is not dependent upon a high output per animal; Ireland has, in fact, one of the lowest production-per-cow rates in northern Europe.

The country ranking lowest in Western Europe was Portugal, with only 80 pounds per person produced in 1953. Yet Portugal has been confronted with a "surplus" butter situation, attributed to a drop in consumer income and causing considerable unrest among dairy farmers. Because of distribution difficulties, Portugal consumes the largest part of its milk in the form of butter and cheese.

Of all the Western European countries, only the United Kingdom, Western Germany, and Belgium were net importers of milk and milk products in 1953. All the others, including low-producing Spain and Portugal, exported more than they imported.

The dairy industries of the countries behind the Iron Curtain suffered during World War II, and the number of milk cows in 1953 were generally lower than in prewar years. Since 1946, milk production had been rising but, according to reliable sources, it reached a peak in 1953 and dropped off during 1954.

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[2] PER CAPITA CONSUMPTION OF DAIRY PRODUCTS IN 1953, p. 10. U. S. Foreign Agr. Serv. Cir. FD–10–54. 1954. [Mimeographed.]

J. C. Eiland

This Greek farmer, like many farmers of the Middle East and Africa, depends on his sheep for milk. In Europe, much of the ewe's milk goes into world-famous cheeses.

In Poland, for example, where a production of about 600 pounds per capita was obtained in 1953, dairy farming in 1954 is said to have been in a state of disorganization. Dairy farmers reportedly have been slaughtering their cattle because of lack of fodder. Even so, milk yields per cow are decreasing; they are said to be under 1,000 pounds per year in some areas.[3]

In Czechoslovakia, milk production has been rising from the immediate postwar figure of approximately 465 pounds per capita; by 1953, however, it had recovered only about half the ground lost since before the war, when an estimated 685 pounds per person was produced.

In Eastern Germany, milk production is considerably under the output in Western Germany and probably is no more than one-half the figure of 980 pounds in prewar Germany.

In Hungary and Bulgaria, production, while above the immediate postwar figures, is still somewhat below the 1938 output of approximately 400 and 375 pounds per person, respectively.

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[3] WORLD-WIDE REPORT. Irish Agricultural and Creamery Review, v. 18, No. 249, p. 19. Dublin. September 1954.

In Albania, milk production is probably not much different from the estimated 30 million pounds produced before the war.

In the Soviet Union, the number of cows in 1953 was smaller by several million head than it had been before the war, and milk production was about 10 percent under the 63.6 billion pounds reported for 1938 from the areas that made up the Soviet Union before the war. Milk yields have been low, and after the war the annual yield per cow was reported at only 2,083 pounds;[4] the yield for 1953 was only a little higher.

During 1953, Russia found it necessary to purchase 91 million pounds of butter and over 4 million pounds of cheese in the world market. During the latter part of 1954, it was announced that the Soviet Union hoped to raise its butter production,[5] but the reported 1954 commercial butter output of just over 800 million pounds was far below the official target of more than a billion pounds. And still to be felt is the effect the recent political change may have on the agricultural goals.

Americas: milk plays important role

Domestic cattle, sheep, and goats were introduced into the Western Hemisphere by European conquerors and settlers in the 16th century. Slowly, over the years, milk and milk products have become an important part of the diets of people in most of the Americas. In 1953, about 30 percent of the world's milk supply was produced in the Western Hemisphere, and most of that was consumed in the country in which it was produced; the United States, Canada, and Argentina, the largest producers, had net exports in 1953 of only slightly more than 1 percent of their combined total production; most of this trade was with other Western Hemisphere nations.

Although not one of the Big Three producers of the hemisphere, Uruguay has a dairy industry that merits special note. Its rather astounding milk output of 520 pounds per capita in 1953, almost entirely from cows, was achieved despite the fact that Uruguay has traditionally depended on its sheep industry for much of its income from agriculture.

The 1953 per capita figure represents a substantial rise in Uruguay's milk production since the severe drought of 1943. The number of cows has increased almost 45 percent, augmented somewhat by the importation of substantial numbers of purebred dairy cattle. The output of milk is much higher than before the war.

It appears that the important consideration in Uruguay is no longer one of increasing milk output but of cutting substantially the rather high cost of production. The natural conditions in Uruguay favor high-production, low-cost dairying. To achieve lower costs, farmers need to rely less on high-cost supplemental feeds and concentrates and more on pasture and forage crops, which are abundantly available. And an intensified program of culling would probably cut costs substantially.

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[4] Volin, Lazar. A SURVEY OF SOVIET RUSSIAN AGRICULTURE. U. S. Dept. Agr. Monograph 5, p. 164. 1951.

[5] U. S. S. R. TO EXPAND BUTTER PRODUCTION. Foreign Crops and Markets, v. 69, No. 19, Nov. 8, 1954.

Other South American countries also have improved their milk production considerably. Paraguay, to the north, has achieved a production of an estimated 295 pounds of milk per capita. This it has done not so much because it has an advanced dairy industry as because it has most of its farming population concentrated on flat fertile plains that will sustain large numbers of livestock.

Colombia has shown remarkable gains in the production of milk in the past few years, making considerably more use of livestock for milk. The wide variation in the country's terrain, soil, and climate makes for a diversified agriculture; still, about one-fifth of the land is used for the 1.5 million head of livestock. In the past several years, both government and private individuals have made notable progress in cattle improvement programs; considerable numbers of imported Holsteins, Brown Swiss, and Red Polls are now found around the milksheds of Bogotá and Medellín, where the climate is cool.

Ecuadoran farm woman tends to her milking chore with a calmness apparently not shared by her child. In Ecuador, milk production per capita is only about 100 pounds.

Milk production in South America is lowest in the Guianas, where, peculiarly enough, there are few livestock diseases, an unusual condition in wet tropical countries. The main obstacle in this area to greater output is undoubtedly the lack of adequate facilities to produce and market milk and dairy products efficiently.

Outside of the Guianas, Peru is the low producer in South America; in 1953, its output was less than 90 pounds of milk per person. Peru's primary difficulty lies in the fact that much of the country's agriculture is subsistence farming carried on by primitive methods on small farms in the Sierra region.

Peru has advanced considerably in the past two decades in the use of animals for food, but the number of cattle, estimated at 3.2 million in 1953, is low for such a large country. Most of the stock are Criollo cows that seldom produce more than 2 quarts of milk a day and do so for only about 5 months. Lack of technical knowledge, good herd management practices, and marketing facilities for milk make the livestock of Peru more valuable to farmers for meat and hides than for milk.

Central America: production increases

Central America also has moved ahead in the production of milk since the war. Much of this progress is due to programs of agricultural diversification, in which Central American countries have engaged in varying degrees. The programs are the result of these countries' wartime experience in having to rely on local milk production and of their wish to reduce their dependence on a single agricultural commodity.

Nicaragua, with Central America's highest milk production figure in 1953 (estimated at 218 pounds per capita), is an example. There, the Government has called upon experts from other countries to survey the situation and to make recommendations for the improvement of the agriculture of the country with emphasis on better dairying, since Nicaragua envisions an extremely profitable market in dairy products among its Central American neighbors. It is well known that several essentials for an efficient dairy industry are lacking. Cows are not in the best condition and, even in the Managua milkshed, no clear distinction is made between beef and dairy types of cattle. The feed supply is too dependent on the rains; pastures have been improved and fair use is made of them for grazing, but little or no grass is cut for feeding as hay. Milking practices are still primitive, and milking is often done in the open with calves present to promote lacteal flow.

Much of the milk produced in Nicaragua reaches the table not in fluid form but as butter and cheese because roads and other means of transportation are inadequate. However, a road-building program, financed by money advanced by the International Bank for Reconstruction and

Development, is well underway and should be completed during 1955 or the early part of 1956. The improvement of the Inter-American Highway and the so-called Rama project will be of untold value in getting agricultural products to market.

Guatemala also has increased its milk production substantially since the war, but not nearly enough to meet the demand. As a result, Guatemala is forced to import a considerable amount of its dairy products. Inadequate transportation facilities, and the consequent isolation of rural areas, has been a primary deterrent to the development of a dairy industry.

The climate of Guatemala generally is conducive to cattle raising, but is probably most suitable in the areas at altitudes of 2,000 to 3,000 feet. And the country could undoubtedly provide sufficient supplemental feeds for dairy animals from coffee wastes and molasses.

Other Central American Republics have fairly high livestock numbers, but cattle depend almost entirely on grass; and, because of the alternate wet and dry seasons, pasture is not always abundant. Throughout Central America, both processing and distribution facilities are limited, and much of the flush-period production does not reach the urban consumer. The governments of the countries appear fully aware of the limitations and, through development authorities, plan to increase the efficiency of the marketing and distribution of agricultural products.

UNICEF (the United Nations Children's Fund) has established, or plans to establish, milk-drying plants in the Central American countries. The plants belong to the countries in which they are located but will provide UNICEF with dried milk for its child-feeding programs.

Caribbean: production is low

In much of the Caribbean, people are not accustomed to drinking milk, and production is low. They have quite a large number of cattle but, on many islands, value them chiefly as a medium of exchange. Livestock management is still primitive: stall feeding of cattle is almost unheard of; instead, animals are pastured and left to fend for themselves.

Only in Cuba is dairying considered of real importance; there it ranks among the first five of the island's industries. The estimated 236 pounds of milk produced per capita in 1953 came from two types of herds—both the basis for commercial dairy operations—the dairy herds around Havana and some of the other large cities and the dual-purpose herds of central and eastern Cuba. It is in the latter regions that much of the manufacture of dairy products is carried on.

To supplement local supplies, Cuba long imported a considerable amount of dairy products. Production has been increasing faster than demand for local products, and, because of its inadequate distribution facilities, Cuba has looked for export markets for some of its output, mainly butter. The need to seek export markets has not been due to the lack of domestic demand per se but to the lack of that demand at the prices required by Cuban production. At the time of this writing, however, a prolonged drought has required that Cuba again resort to importing butter to meet requirements.

The yield of milk per cow is low in Cuba, owing in part to inadequate supplementary feeding and in part to the reliance on dual-purpose cattle. The Cuban livestock industry would probably be in a more favorable position if it developed separate beef and dairy herds.

Other Caribbean areas are placing increased emphasis on milk production; among them is Puerto Rico, where livestock and livestock products rank second only to sugar in the economy. The raising of livestock once went hand in hand with the sugar industry, in which large numbers of draft animals were required. Since the war, however, the sugar industry has mechanized and reduced its dependence on draft animals; this change has been accompanied by a rapid expansion of the dairy industry, and the production of milk has probably increased by 50 percent. Furthermore, Puerto Rico, which has had to depend upon imports for its manufactured dairy products, is now getting its first processing plant, built with Puerto Rican capital and the assistance of the Dairy Industries Society, International.

However, Puerto Rico still has a long way to go to meet basic dietary requirements from domestic production. In 1944 the Puerto Rico Planning Board estimated that cattle for slaughter should be increased 3½ times and cattle for milk more than 6 times. The census for 1940 showed a cattle population of 343,000, while the 1950 census gives the number of cattle and calves in Puerto Rico at 289,000, a decrease of almost 16 percent.

In the other islands of the Caribbean, milk production varies from less than 50 pounds per capita for the areas to the south, like Trinidad and Martinique, to somewhat above 100 pounds for those to the north.

Middle East: depends on other animals

It is believed that in the Middle East man first added the milk of animals to his diet. Here, the settled agricultural peoples of 6,000 to 8,000 years ago depended on grains for their staple food, but the nomadic tribes relied on their herds and flocks. Life in that region is little changed today. The dependence of the nomad upon his animals is well told by Sanger.[6] Pointing out that during the cooler months the Bedouin may go for 3 days without drinking water, he adds, "The small consumption of water, however, is balanced by a high consumption of camel's milk. A female camel will produce between 1 and 7 liters a day, and the milk is either drunk warm or else poured into a leather bag and allowed to sour, making a very popular drink which sits well on the stomach in the hot climate. Largely because the supply of milk varies directly with the amount of pasturage, the nomads keep their flocks moving in search of new forage which springs up after the desert rains."

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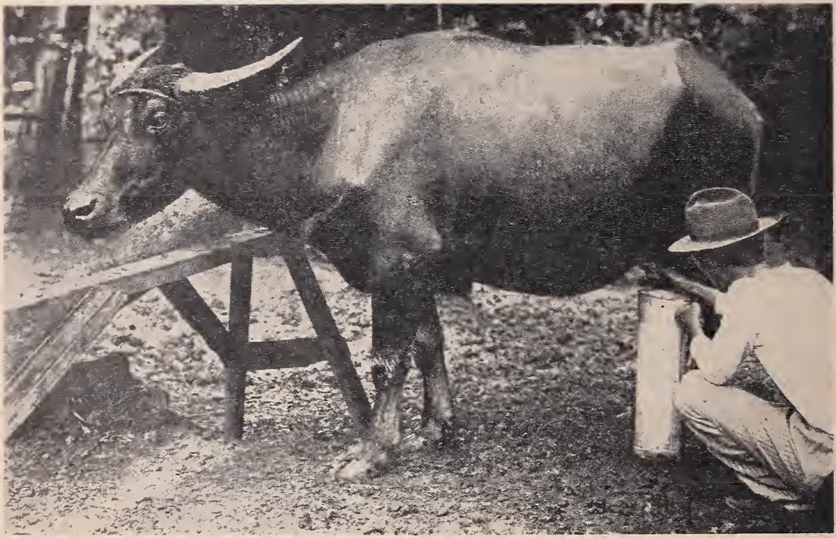
[6] Sanger, Richard H. THE ARABIAN PENINSULA, p. 86. Cornell University Press. 1954.

Now, as in the past, most of the milk in the Middle East is obtained from animals other than cattle. Considering the animal husbandry practices of nomadic tribesmen, the climate, and the terrain, the yields of milk appear exceptionally good.



Water buffaloes, though heavily used for draft power, are a primary source of milk in the tropical countries of the East.

In the large urban centers of the Middle East, there are small dairy herds, which supply inadequate amounts of milk. Some of the animals are maintained on small farms nearby, but many are kept right in the cities and led from customer to customer as long as the milk supply holds out. The animals are fairly well fed, but the milk is produced under primitive conditions and without any sanitary safeguards.

Animals are fed only as long as they are producing. Dry cows often are sold to slaughterhouses and most young calves also are sold there. Under such conditions the good milk-producing animals get little chance to perpetuate themselves, and the herds, being maintained by purchase rather than breeding, are inferior.

There is a vast area for improving milk production in the Middle East. In the urban areas, dairying would doubtless benefit if it were maintained outside the city proper, perhaps in concentrations allowing for central collection of milk, such as is practiced in the Bombay milkshed in India.[7] In the more or less settled agricultural areas, measures will have to be taken to improve natural pastures, particularly in the mountains where overgrazing is common, and the production of fodder crops will have to be increased; forage would still depend, however, to a large extent upon rainfall. Productivity would be further raised by the introduction of more widespread supplemental feeding practices during the dry seasons common to the areas.

The nomadic groups in the Middle Eastern countries can be helped to increase their milk production by providing them with better watering facilities, reseeding their pasture lands, and giving them the assistance of trained veterinarians to control disease among their animals.

At the present time, in many areas of the Middle East, the farmer is fully employed only when he is raising his winter crops. The introduction of milk animals for dairying purposes would give him year-round employment, raise his income, and increase the amount of milk available.

Israel is an exception. Almost all livestock there is maintained for dairy purposes, and most of the production is of cow's milk. Milk and milk products are the largest single source of mixed-farming income in Israel. It is estimated that over 40 percent of the cows are concentrated in large communal settlements, which may have from 600 to 700 cows in milk at any one time. About 70 percent of the breeding of dairy cattle is by artificial insemination.

Goats and sheep have only recently become part of the Jewish dairy farming scene; Swiss Saanen goats have been introduced, and milk yields of native sheep and Damascus goats have been increased.

In the Arabian States the production of milk is very small, and most of it comes from nomadic herds. The production per capita permits only an insignificant intake.

Turkey has many of the trappings of its Western neighbors, but it has not yet fully modernized its production and processing of milk. Except for a few fairly large dairy herds in the vicinity of large cities, practically all livestock used for milk are general-purpose animals. The cows and buffaloes are kept to supply some draft power, some milk, and a calf to sell or to keep for work. Sheep and goats furnish milk, wool, skins, and meat; lambs are sold at an early age so that the ewes may be milked as soon as possible after freshening.

Management and feeding practices are not advanced, and milk yield per animal is not high. Furthermore, because of the lack of storage, handling, and processing facilities, most markets for dairy products are localized, and there is not much incentive for the average Turkish farmer to emphasize dairying.

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[7] Shearer, Eric. MILK FOR BOMBAY'S MILLIONS. Foreign Agriculture, v. 18, No. 9. 1954.

Asia: many people, little milk

Cattle and buffaloes are important in Asia primarily as draft animals; their development and improvement as a source of food have always been secondary. For on that continent are congregated about half of the world's people, many of them depending for a living on small farms cultivated in a primitive manner and yielding so little that any specialization in dairying is out of the question. More animals are to be found there than in all the Western Hemisphere; thus, competition between man and animal for the products of the land is serious. The problem of feeding livestock has been acute and is becoming more so. As a result, milk yields are low, and the contribution of milk to the diets of Asian peoples is generally insufficient. Although there is room for a vast improvement in the production of milk and a pressing need for milk proteins, in many parts of the Asian Continent it is almost impossible to divert enough of of the crops from human food to animal feed.

The highest intensity of milk production in Asia is found in Afghanistan. Animal numbers there are said to have changed little in the past several decades, and milk production is not much above that recorded by the Food and Agriculture Organization for 1948.

Its extensive grazing lands make Afghanistan particularly suitable to stock raising, and livestock constitutes a main source of wealth and income for the Afghan. The number of domestic livestock of the country is high in relation to human population.[8]

Milk is obtained from all types of milking animals—sheep, goats, camels, asses, and cattle. The cows are the humped varieties of the east and are also related to the Russian breed, Kholmogor. Dairy products, especially the pressed and dried curd called krut, comprise an important part of the Afghan diet.

India, as May [9] points out, provides the most challenging problem of all. Although their country has the greatest number of cattle in the world, Indian people suffer from want of animal proteins. For millions, the only source is milk. Many Indians never eat meat; to the Hindu, for instance, the cow is a sacred animal that cannot be killed. Hence, many of the cows are old and have long ceased to be producers, but still they exist off the same pastures as the producing animals, in effect cutting production per animal in two ways. In general other dairy practices are as uneconomical.

India recognizes that a much higher output could be consumed in the country and, in an attempt to solve some of its dairy problems, has adopted such forward-looking programs as the Bombay milk scheme.[10]

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[8] AGRICULTURE IN POINT 4 COUNTRIES—PART iii. SOUTH AND SOUTHEAST ASIA, p. 2. U. S. Dept. State. 1952.

[9] May, op. cit., p. 20.

[10] Shearer, op. cit.

The camel is an important source of milk for the desert people of the Middle East and Asia.

Expert opinion is that with the same number of milk animals, the production per capita could be raised, from 115 pounds annually to over 264 pounds. A 30-percent increase in the figure could be obtained through disease control, another 50 percent through better feeding and management, and another 50 percent through improved breeding practices.[11]

In Pakistan, milk production is carried out substantially as in India, with most of the milk being supplied in about equal quantities by cows and buffaloes (although cattle outnumber buffaloes 4 to 1) and a little more than 10 percent by goats. As Bishop points out,[12] Pakistan has no facilities for marketing milk over long distances, and the milk sold in urban areas is produced locally or within the radius of a few miles. Milk production per animal is small, prices are high, and adulteration of milk widespread. About a third is consumed in fluid form.

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[11] AGRICULTURE IN ASIA AND THE FAR EAST—DEVELOPMENT AND OUTLOOK, p. 109. Food and Agriculture Organization. Rome. 1953.

[12] Bishop, Dwight R. THE CONSUMPTION OF AGRICULTURAL PRODUCTS IN PAKISTAN, p. 40. U. S. Foreign Agr. Serv. 1954.

Pakistan is divided into two parts. West Pakistan has an area of 310,000 square miles and just under 34 million people. East Pakistan, almost completely surrounded by India, is a tropical area of only 55,000 square miles, about one-sixth the size of West Pakistan but with a population of 42 million. Although East Pakistan has about 50 percent of the cattle and buffaloes, most of them are used for draft purposes; less than 5 percent are milking buffaloes. In 1953, milk production in East Pakistan was an estimated 2,400 million pounds, or only 56 pounds per person; in West Pakistan, 11,125 million pounds, or 327 pounds per person. Considering the country as a whole, milk production per capita was 178 pounds.

In both India and Pakistan, and in other parts of southeast Asia, livestock management is in the hands of villagers and small landholders. In these areas—Burma, Thailand, Ceylon, and Indonesia, for instance—cattle are dependent upon whatever grazing is available in communal grounds around the landholdings, along roadsides, in waste areas, and, if available, in forests. The milk production of these animals follows, perforce, the natural vegetation cycle: during the seasonal monsoon or other rains, production is good; during the dry season, it drops rapidly. Since human beings require most of the crop output, livestock in the area receive little or no supplemental feed. Yet in many areas, peanut cake is used as a fertilizer when it would be more valuable as feed.[13] The status of milk in these four Asian countries, none of which produced as much as 50 pounds per person in 1953, is illustrated by a recent note from Ceylon.[14] The dispatch from Colombo states that tax concessions may be granted to farmers in order to achieve a daily milk supply of 16,000 quarts for that city of 425,000 people.

Japan prior to World War II had about 170,000 dairy cattle, and milk production per capita was under 10 pounds. During the war the number of dairy cows jumped to a high of 265,000 to provide milk and milk products not so much to meet food needs as to meet military demands for milk casein for glue. After the war the numbers of cows dropped rapidly because of the shortage in food and feed, and not until 1952 did they again equal the prewar peak; in 1953 they increased another 17 percent to an alltime high of 323,000 head, and production of milk at 20 pounds per person was double the prewar rate.

Japan's northernmost island, Hokkaido, accounts for slightly more than one-third of the milk production of the country. There farm holdings are around 10–12 acres, about four times those of other areas, but the number of animals per farm is comparatively small; probably 90 percent of all farmers have no more than two cows and most of them only one.

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[13] AGRICULTURE IN ASIA AND THE FAR EAST, op. cit., p. 115.

[14] CEYLON MAY GRANT TAX EXEMPTIONS TO ENCOURAGE MILK PRODUCTION. Foreign Crops and Markets, v. 69, No. 16, Oct. 18, 1954.

In China, average consumption of milk is probably less than a pound a year per person. In the areas of settled agriculture, where most of the livestock is to be found, two factors militate against extensive milk production. The first is the inadequate grain supply of the country: livestock competes with man for it, and, as a result, is ill-fed and quite incapable of production at anything approaching Western standards. The second is custom: in the south, milk is rarely used, for the people have not only inadequate knowledge of nutrition, but, as May points out, an aversion for milk, which has strongly penetrated the mores of the surrounding countries of Southeast Asia.[15]

The nomadic groups of northern China are usually dependent upon livestock and their milk output. But there the weather is often severe and the forage poor, and milk production consequently is limited. About one-sixth of the total milk production of China comes from camels, yaks, and the hybrid Pien Niu.

To the native African, cattle are considered a measure of wealth. Since their number rather than their productivity is stressed, milk output in Africa as a whole is low.

Africa: a "cattle poor" continent

The problem of living space, so acute in Asia, does not generally exist in Africa, where there is roughly 10 times as much land available per person. But Africa is "cattle poor." It is so, not because it has too few animals but because it has too many and uses them uneconomically.

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[15] May, op. cit., p. 19.

The native African generally regards his animals as wealth, rather than as converters of feed into human food. The number of his livestock, not the condition or productivity of his stock, determines his social position.

The situation is well described in a report on one of the African areas issued by the Mutual Security Agency of the United States:[16] ". . . most of the cattle in Ruanda-Urundi are owned by the ruling class, the Watusi, who represent less than 10 percent of the population. The cattle are kept by the numerous Bahutu tribesmen for the owners. The ownership of cattle is a badge of wealth and social prestige—the greater the number of cattle owned, regardless of quality, the greater the affluence and prestige of the owner. Cattle are commonly used in the fulfillment of obligations incurred in the procurement of wives. As a consequence, only minor attention is given to the raising of cattle for milk or for slaughter. Milk yields are extremely low and cattle are used for meat only when they die naturally or when they must be killed because of injuries." Significantly, per capita milk production in Ruanda-Urundi is one of the lowest in Africa and pulls estimated production for the entire Congo down to only 6 pounds per person annually.

Furthermore, in many areas, livestock are often associated with religious beliefs and practices. The result of these customs has been overstocking, overgrazing, and erosion. The picture of a half-starved animal trying to live off a denuded soil is not uncommon. And, since milk is not considered an essential food—in many areas of high mortality a child, once weaned, may never again taste milk—it is not surprising that milk production in the African Continent in 1953 was only 112 pounds per capita.

The distribution of cattle in Africa is determined primarily by the existence of the tsetse fly, which spreads trypanosomiasis, or sleeping sickness. The tsetse fly is most prevalent in an area extending in the north from the mouth of the Senegal River through Lake Chad to the coast of the Somalilands and in the south from Angola into Mozambique. The dwarf cattle, which are best able to resist the trypanosome, are found in this vast area along with goats and other resistant livestock.

Only two countries in Africa—Liberia and Mozambique—produce less milk than does the Congo.

Soils in the independent Republic of Liberia are primarily suited to tree crops, and landholdings are small, as is the number of livestock.

The low production figure for Mozambique is due in part to the prevalence of the tsetse fly. Only the southern part of the country is relatively free of the fly, and it is here that nearly all of the milk is produced. A few of the cattle are owned by Europeans and only very few are registered dairy cows. The country from the Limpopo Valley to the south has fertile alluvial soils which produce good grass and could support many more cattle than it now does.

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[16] Hathcock, James S. A STUDY OF AGRICULTURAL CONDITIONS IN THE BELGIAN CONGO AND RUANDA-URUNDI, p. 25. Office of the United States Special Representative in Europe. [U. S. Mutual Security Agency.] September 1952.

In the Nile Valley, records of animal husbandry go back to about 3000 B. C. In tombs of the Fifth Dynasty Pharaohs are depicted many of the cattle, sheep, and goat species common in Egypt and the Sudan today. Camels and water buffaloes, also sources of milk production in the Nile regions, are not represented in ancient Egyptian tombs; camels are believed to have been introduced into North Africa during the so-called Persian period, around 500 B. C., and water buffaloes are a more modern acquisition, from India.

In Egypt the populations of cattle and water buffaloes are about equal, but the buffalo is the bigger milk producer: cattle are valued more for meat than for milk. Both are important as work animals, but on the smaller farms the buffalo is favored, even to the extent of living with the family and serving in winter as a kind of heating unit. The number of animals in Egypt has dropped in the past several years, reflecting the fact that they have exceeded pasture capacity and other feed resources. In terms of milk, however, production is expected to increase with the recent introduction of improved management practices, including a shift in dependence on lower cost cow's milk.

In Ethiopia and the Somalis, milk production has increased considerably since the war. These areas have temperate climatic zones in a series of highly fertile plateaus.

In Ethiopia, for example, agriculture is, generally speaking, of two principal types—general farming and grazing. Even in the former, a considerable amount of stock is raised, which, compared to that in other African areas, is relatively disease free. Dairy farming as such is not practiced extensively in Ethiopia, but there are indications that throughout the country more use is being made of animals for milk.

Only in the south of Africa can dairying be said to be a major agricultural purusit. The Union of South Africa and its Trust Territory, South-West Africa, had in 1953 a combined milk production per capita of 372 pounds. Although in many African countries the value of milk was unknown until the natives learned from Europeans that it was palatable and healthful, dairying of a sort was carried on along the Cape long before the white man set foot in South Africa. When the Dutch East India Company established a refueling and provision station on the Cape, about the middle of the 17th century, cattle were purchased from Bantu and Hottentot tribesmen to provide milk and dairy supplies for both station and ships.

That native Africans have a taste for milk and can succeed at dairying, even in tropical climates, is evidenced by reports from the Gold Coast and Kenya. The Gold Coast, which lies just above the Equator in

British West Africa, has a population of 4.5 million, only 6,700 [17] of which are non-Africans. During 1953 the Gold Coast produced an estimated 49 million pounds of milk, about 11 pounds per capita. Statistics showed that additional dairy products were imported to the extent of 7 pounds of milk per capita.

Other parts of British West Africa, particularly Nigeria, have also been importing dairy products; but, during the past several years, native Nigerian farmers have increased milk output for use in urban areas.

Kenya, which lies on the Equator in British East Africa, has started several ventures among native Africans to help expand milk production. As a result, these farmers are currently delivering 20,000 pounds of milk daily to a government pasteurizing plant for use as fluid milk in Mombasa; formerly, the production of fluid milk for sale was exclusively the function of European farmers in the territory. Elsewhere in the colony, native farmers are joining together in cooperative groups to supply milk to towns and to manufacture ghee. In these projects, only the morning's milk is used, leaving about one-third of the milk for home use. It has been found that providing the native producer with a market for milk and milk products has increased his own milk consumption, for he is thus encouraged to milk out all his cows.[18]

Requirements exceed production

Pointing out that milk contains both energy value and protective food elements in concentrated amounts, May states that "all starvation areas would disappear and maps of disease would lose their meaning" if the nearly 2 billion underfed people would drink a quart of milk each day.[19] This would require raising world milk production 3¼ times.

Even raising milk production to minimum nutritional levels is still to be accomplished. Nutritionists recommend a pint of milk a day, or its equivalent in whole milk products, as the minimum dietary requirement for adults; this is for people who are eating enough meat, vegetables, and fruits. For people who are not, the requirement is of course higher, as it is for children, the sick, pregnant women, and nursing mothers. But the world is producing less than two-thirds of this amount.

Furthermore, much of the total production is consumed in the primary producing countries, where per capita consumption [20] is considerably more than a pint a day. Most of the countries of the world produce less than minimal requirements, many of them much less than one-fourth of this level.

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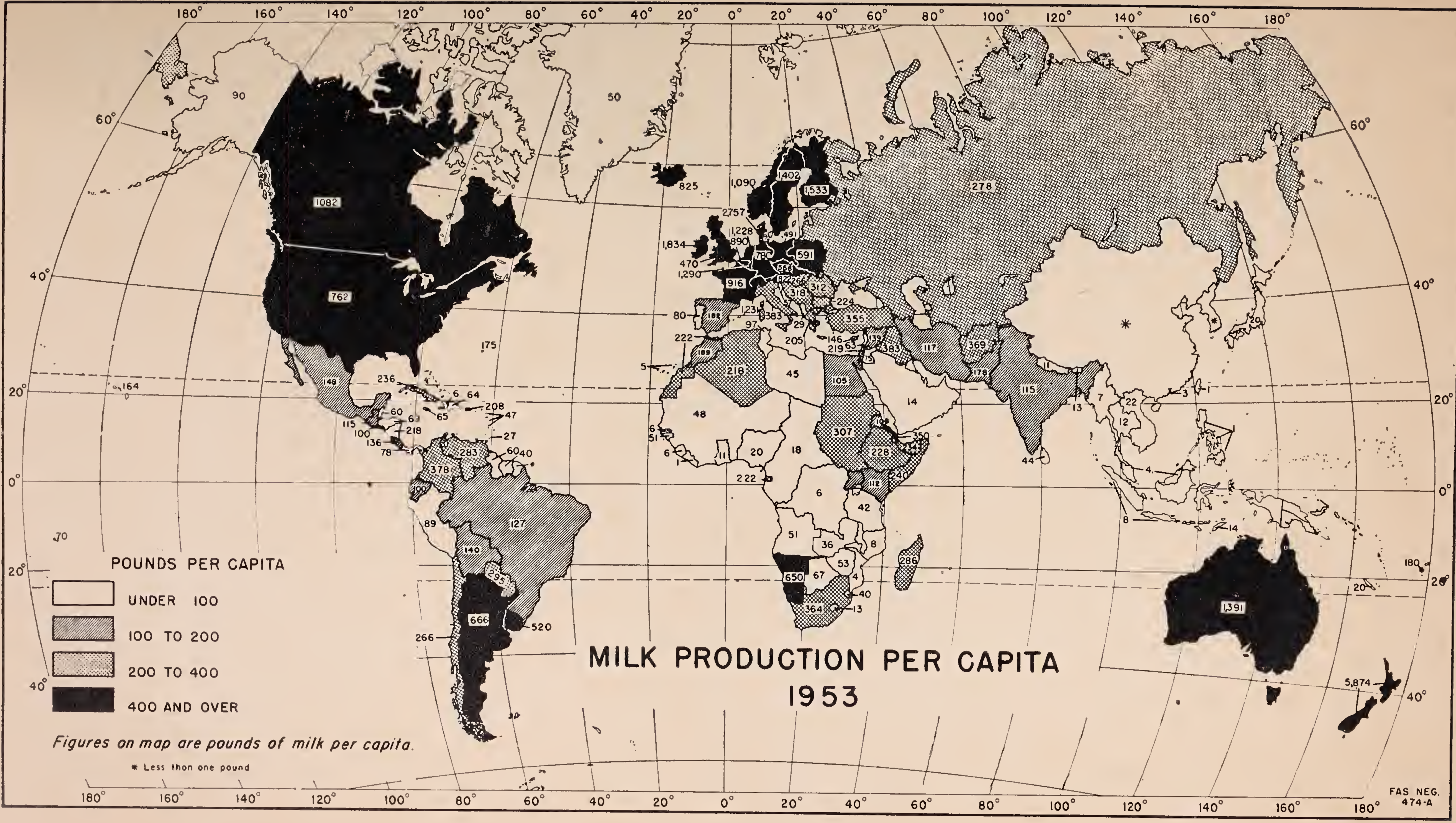
[17] The Empire and Commonwealth Yearbook 1953–54, p. 176. London. 1953.

[18] Barrett, M. THE DAIRY INDUSTRY OF KENYA. Food Industries of South Africa, v. 4, No. 6, p. 45. Capetown, Union of South Africa. October 1951.

[19] May, op. cit., p. 29.

[20] PER CAPITA CONSUMPTION OF DAIRY PRODUCTS IN 1953, op. cit., p. 3.

MILK PRODUCTION PER CAPITA
1953



Figures on map are pounds of milk per capita.

* Less than one pound

Since 400 pounds of milk per person per annum has been considered a minimum nutritional need, production in the countries of the world is shown on the map in relation to that figure. Countries with a production per capita of 400 pounds or more annually comprise much of the land area lying above the Tropic of Cancer and below the Tropic of Capricorn. European exceptions are Greece, Italy, Bulgaria, Hungary, Rumania, and the U. S. S. R—all of which fall into the second highest production category, 200–400 pounds per capita annually—and Spain and Portugal.

The United States, Canada, Argentina, and Uruguay in the Western Hemisphere are the only surplus areas in the Americas.

In Africa, only South-West Africa is a surplus area. Most of the milk produced by the 400,000 people in South-West Africa finds its way into the Union's marketing channels.

In the Middle East, while production is relatively high, in no area is it sufficient to give the population the minimum amount of milk. In Asia, of course, the situation is even worse; in no country is production sufficient to give the population an average of 200 pounds yearly.

The 600 billion pounds produced in 1953 would permit each of the world's 2,461.4 million people only 244 pounds of milk to be consumed in the form of fluid milk and whole milk products such as butter, cheese, and canned and dried whole milk; this amounts to 1 quart of milk about every 3 days.

However, in working out diets, nutritionists consider butter a fat rather than a dairy product and do not include it as part of the 400-pound requirement. Furthermore, the milk proteins that have been removed as skim milk in the manufacture of butter may be lost completely to human consumption; in Denmark, for example, skim milk is used primarily in the swine-raising industry. In 1953, the estimated 8.5 billion pounds of butter produced took about 180 billion pounds of the total milk production, leaving only about 420 billion pounds to be consumed as fluid milk or whole milk products; this amounts to only 171 pounds per person, and the quantity available drops from 1 quart every 3 days to 1 quart every 1½ days.

But, people have learned to dry skim milk and preserve it in the form of nonfat dry milk solids and to use it in many ways in the preparation of food. Therefore, if it is assumed that one-half of the nonfat solids in milk going to butter manufacture are lost to human consumption but that the other half is consumed by human beings as buttermilk, skim milk, and other skim milk products, the amount of whole-milk equivalent available during 1953 was 207 pounds per person. And the quantity of whole-milk equivalent available was 1 quart about every 4 days.

Since nutritionists consider as a minimum requirement 400 pounds per person per year for whole milk or its equivalent in dairy products, it is quite apparent that milk production during 1953 was not sufficient. Allowing for all the milk that went into buttermaking and considered lost to human consumption, production would have had to be 1,165 billion pounds in 1953 in order to give each person 400 pounds of whole milk or its equivalent; this is almost twice the recorded production. If one-half the milk going to buttermaking is used for human consumption by persons' consuming nonfat solids along with the butter, then production would have had to reach 1,075 billion pounds, an increase of 80 percent, in order to give every person 400 pounds. On the other hand, if it is considered that all milk produced is consumed in whole form or its equivalent, milk production would still have had to be increased about 65 percent, to 985 billion pounds.

The above premises, of course, assume also that the supply would be equitably distributed among the countries and people of the world to the extent of 400 pounds per person. This is quite impossible, but an alternative consideration presents itself. That alternative (table 4) is to examine world milk production from the standpoint of minimum need, and in so examining it to assume that countries now producing more than enough to meet the minimum standard would continue to produce the amount they actually did in 1953 and that the other countries would increase their output to the amount required to supply each person with 400 pounds of milk per year.

To provide everyone in the deficient countries of the world with 400 pounds of milk per annum, production in 1953 would have needed to have been almost double, and the low producing countries would have had to increase their output by 2.6 times. A total production of over 1,179 billion pounds would have been required.

Most of the increase would have had to come in Asia, where the increase in production would have had to reach 6.6 times the output in 1953.

TABLE 4.—*Production required to assure 400 pounds of milk per person per year, 1953*

Area	Population	Actual production	Production required	Increase	Percent increase
North America:		*Million pounds*	*Million pounds*	*Million pounds*	
Countries producing over 400 lbs	*Millions* 174. 9	138, 137	138, 137	-------	-------
Countries producing under 400 lbs	54. 6	7, 468	21, 840	14, 372	192. 4
Total or average	229. 5	145, 605	159, 977	14, 372	9. 9
South America:					
Countries producing over 400 lbs	20. 8	13, 501	13, 501	-------	-------
Countries producing under 400 lbs	96. 9	16, 817	38, 760	21, 943	130. 5
Total or average	117. 7	30, 318	52, 261	21, 943	72. 4

TABLE 4—*Production required to assure 400 pounds of milk per person per year, 1953*—Continued

Area	Population	Actual production	Production required	Increase	Percent increase
Western Europe:		*Million*	*Million*	*Million*	
Countries producing over 400 lbs	*Millions* 195. 8	*pounds* 171, 339	*pounds* 171, 339	*pounds* -------	-------
Countries producing under 400 lbs	110. 1	31, 153	44, 040	12, 887	41. 4
Total or average	305. 9	202, 492	215, 379	12, 887	6. 4
Eastern Europe (including U. S. S. R.):					
Countries producing over 400 lbs	54. 6	30, 117	30, 117	-------	-------
Countries producing under 400 lbs	238. 8	66, 165	95, 520	29, 355	42. 1
Total or average	293. 4	96, 282	125, 637	29, 355	30. 5
Africa:					
Countries producing over 400 lbs	. 5	340	340	-------	-------
Countries producing under 400 lbs	209. 9	23, 248	83, 960	60, 712	261. 1
Total or average	210. 4	23, 588	84, 300	60, 712	257. 4
Middle East:					
Countries producing over 400 lbs	-------	-------	-------	-------	-------
Countries producing under 400 lbs	65. 3	13, 453	26, 120	12, 667	94. 2
Total or average	65. 3	13, 453	26, 120	12, 667	94. 2
Asia:					
Countries producing over 400 lbs	-------	-------	-------	-------	-------
Countries producing under 400 lbs	1, 225. 7	64, 508	490, 280	425, 772	660. 0
Total or average	1, 225. 7	64, 508	490, 280	425, 772	660. 0
Oceania:					
Countries producing over 400 lbs	10. 8	23, 991	23, 991	-------	-------
Countries producing under 400 lbs	2. 7	145	1, 080	935	644. 8
Total or average	13. 5	24, 136	25, 071	935	3. 9
World:					
Countries producing over 400 lbs	457. 4	377, 425	377, 425	-------	-------
Countries producing under 400 lbs	2, 004. 0	222, 957	801, 600	578, 653	259. 5
Total or average	2, 461. 4	600, 382	1, 179, 025	578, 653	96

Source: Compiled by Foreign Agricultural Service from official and unofficial data.

To increase production: long-term task

The fact is that milk production has not increased as much as population and that production per person is under that of the prewar period. For example, in 1953 total production in 15 primary milk-producing countries of the world was 114 percent of prewar, but production per capita stood at only 97 percent.[21] Only in Belgium, France, Norway, Italy, and the United Kingdom were per capita gains made over the prewar period; in Australia the decline is about 20 percent and in Denmark and New Zealand 10 percent.

The relation of production to population in deficit-milk-production areas is even more striking than in the primary producing countries. The population in the deficit areas has increased at a much faster pace than has milk production, even in many of those countries showing the most improvement in production since the war.

The production of milk cannot be increased to any degree overnight; the improved breeding, feeding, and management of livestock, so necessary to increased milk production, are long-term programs. And while production is being gradually raised by these improved husbandry practices, there is still much work to be done in the fields of collection, transportation, handling, processing, and distribution of milk and milk products in order to insure maximum use, minimum waste, and a hygienic product.

There are not only technical problems to be solved, but also an economic one to be faced, since the ability to purchase milk and milk products is essential to an expanding dairy economy. The relatively low production in many countries at the present time may stem as much from the low purchasing power of the consumer as from inadequate production practices. In Africa and Asia there are millions of people who like and would accept milk products if they could afford to buy them. On the North American Continent there are 55 million people who need almost 3 times as much milk and dairy products as they are now able to secure. In South America another 97 million people need almost 2.5 times as much milk and milk products as they are able to obtain. In all, some 2 billion people, more than 80 percent of the world's population, live in countries where milk production is under the level of nutritional need.

With such pressing needs, the world finds itself in an anomalous position. For, while it is trying to raise the production of milk in countries of continued shortages, economic underdevelopment, and widespread malnutrition, it is trying to reduce the backlog in other countries with economic surpluses.

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[1] Ibid.

TABLE 5.—*Estimated world milk production, by country, 1953*—Part I

Country	Cow's milk	Other milk	Total milk	Population	Production per capita
	Million pounds	*Million pounds*	*Million pounds*	*Millions*	*Pounds*
North and Central America:					
Canada (including Newfoundland and Labrador)	16, 441	--------	16, 441	15. 2	1, 082
Costa Rica	123	--------	123	. 9	137
El Salvador	207	3	210	2. 1	100
Guatemala	321	12	333	2. 9	115
Honduras	101	3	104	1. 5	69
Mexico	3, 814	357	4, 171	28. 1	148
Nicaragua	240	--------	240	1. 1	218
Panama	70	--------	70	. 9	78
United States	121, 449	177	121, 626	159. 7	762
Other [1]	16	--------	16	. 2	80
Total or average	142, 782	552	143, 334	212. 6	674
Caribbean:					
Bermuda	7	--------	7	(3)	175
Cuba	1, 376	17	1, 393	5. 9	236
Dominican Republic	140	(2)	140	2. 2	64
Haiti	19	--------	19	3. 1	6
Jamaica	88	10	98	1. 5	65
Puerto Rico	420	37	457	2. 2	208
Virgin Islands	5	--------	5	(3)	167
Other [1]	64	18	82	2. 0	41
Total or average	2, 119	82	2, 201	16. 9	130
Grand total or average	144, 901	634	145, 535	229. 5	634
South America:					
Argentina	11, 804	450	12, 254	18. 4	666
Bolivia	400	35	435	3. 1	140
Brazil	6, 525	550	7, 075	55. 8	127
Chile	1, 552	70	1, 622	6. 1	266
Colombia	4, 500	35	4, 535	12. 0	378
Ecuador	296	49	345	3. 4	100
Paraguay	400	42	442	1. 5	295
Peru	761	42	803	9. 0	89
Uruguay	1, 247	(2)	1, 247	2. 4	520
Venezuela	1, 500	28	1, 528	5. 4	283
Other [1]	29	3	32	. 6	53
Total or average	29, 014	1, 304	30, 318	117. 7	258
Western Europe:					
Austria	5, 344	331	5, 675	6. 9	822
Belgium	7, 781	55	7, 836	8. 8	890
Denmark	11, 856	--------	11, 856	4. 3	2, 757
Finland	6, 283	2	6, 285	4. 1	1, 533
France	38, 590	606	39, 196	42. 8	916
Germany, Western	36, 905	1, 323	38, 228	49. 0	780
Greece	405	1, 217	1, 622	7. 9	205
Iceland	165	--------	165	. 2	825
Ireland	5, 308	12	5, 320	2. 9	1, 834
Italy	16, 335	1, 681	18, 016	47. 0	383
Luxembourg	387	--------	387	. 3	1, 290
Netherlands	12, 837	52	12, 889	10. 5	1, 228
Norway	3, 549	47	3, 596	3. 3	1, 090
Portugal	395	293	688	8. 6	80

See footnotes at end of table.

TABLE 5.—*Estimated world milk production, by country, 1953*—Part I—Continued

Country	Cow's milk	Other milk	Total milk	Population	Production per capita
	Million pounds	*Million pounds*	*Million pounds*	*Millions*	*Pounds*
Western Europe—Continued					
Spain (including Canary Islands)	4, 336	860	5, 196	28. 5	182
Sweden	9, 833	1	9, 834	7. 2	1, 366
Switzerland	5, 937	93	6, 030	4. 9	1, 231
United Kingdom	23, 758	20	23, 778	50. 6	470
Yugoslavia	5, 412	(2)	5, 412	17. 0	318
Other [1]	187	32	219	1. 1	199
Total or average	195, 603	6, 625	202, 228	305. 9	661
Eastern Europe: Total or average	36, 644	2, 613	39, 257	88. 4	444
U. S. S. R.: Total or average	57, 000	25	57, 025	205. 0	278
Middle East:					
Cyprus	7	66	73	. 5	146
Iran	1, 200	1, 080	2, 280	19. 5	117
Iraq	955	1, 000	1, 955	5. 1	383
Israel	295	55	350	1. 6	219
Lebanon	45	37	82	1. 3	63
Syria	220	267	487	3. 5	139
Turkey	3, 550	4, 438	7, 988	22. 5	355
Other [1]	18	220	238	11. 3	21
Total or average	6, 290	7, 163	13, 453	65. 3	206
Africa:					
Algeria	560	1, 587	2, 147	9. 2	233
Belgian Congo (including Ruanda-Urundi)	64	22	86	15. 8	6
British East Africa:					
Kenya	600	50	650	5. 8	112
Nyasaland [4]	12	7	19	2. 5	8
Tanganyika	295	40	335	8. 0	42
Uganda	500	20	520	5. 3	98
Zanzibar and Pemba	14	--------	14	. 3	47
British South Africa	36	15	51	1. 1	46
British Somaliland	40	77	117	. 5	234
Egypt	810	1, 480	2, 290	21. 9	105
Ethiopia	2, 800	620	3, 420	15. 0	228
French Morocco	646	886	1, 532	8. 1	189
French West Africa and Togo	675	200	875	18. 4	48
Gold Coast	35	14	49	4. 5	11
Libya	14	40	54	1. 2	45
Madagascar	1, 240	17	1, 257	4. 4	286
Mauritius	50	--------	50	. 5	100
Mozambique	14	7	21	5. 8	4
Nigeria and British Cameroons	551	72	623	31. 0	20
Northern Rhodesia [4]	71	1	72	2. 0	36
Portuguese Guinea and Angola	208	30	238	4. 7	51
Southern Rhodesia [4]	116	6	122	2. 3	53
South-West Africa	260	(2)	260	. 4	650
Tunisia	115	91	206	3. 6	57
Union of South Africa	4, 105	700	4, 805	13. 2	364
Other [1]	2, 267	1, 508	3, 775	24. 9	152
Total or average	16, 098	7, 490	23, 588	210. 4	112

See footnotes at end of table.

TABLE 5.—*Estimated world milk production, by country, 1953*—Part I—Continued

Country	Cow's milk	Other milk	Total milk	Population	Production per capita
Asia:	*Million pounds*	*Million pounds*	*Million pounds*	*Millions*	*Pounds*
Ceylon	350	(2)	350	7. 9	44
Federation of Malaya (including Borneo)	22	2	24	6. 8	4
India	19, 963	22, 397	42, 360	367. 0	115
Indochina	681	(2)	681	30. 5	22
Indonesia	661	(2)	661	78. 2	8
Japan	1, 558	137	1, 695	86. 7	20
Pakistan	5, 893	7, 632	13, 525	75. 8	178
Philippine Republic	320	(2)	320	21. 0	15
Taiwan (Formosa)	11	(2)	11	8. 0	1
Thailand	226	(2)	226	19. 6	12
Other [1]	1, 800	3, 155	4, 955	524. 2	9
Total or average	31, 485	33, 323	64, 808	1, 225. 7	53
Oceania:					
Australia	12, 243	--------	12, 243	8. 8	1, 391
Fiji	54	--------	54	. 3	180
Hawaii	82	--------	82	. 5	164
New Zealand	11, 748	--------	11, 748	2. 0	5, 874
Other	9	--------	9	1. 9	5
Total or average	24, 136	--------	24, 136	13. 5	1, 788
World total or average	541, 171	59, 177	600, 348	2, 461. 4	244

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[1] For each group of countries, "other" is expanded in part II of this table. [2] Included in cow's milk. [3] Less than 0.05 million. [4] As of Oct. 30, 1953, Federation of Rhodesia and Nyasaland.

TABLE 5.—*Estimated world milk production, by country, 1953*—Part II

Country	Cow's milk	Other milk	Total milk	Population	Production per capita
Other North America:	*Million pounds*	*Million pounds*	*Million pounds*	*Millions*	*Pounds*
Alaska	9	--------	9	0. 1	90
British Honduras	6	--------	6	. 1	60
Greenland	1	--------	1	(1)	50
Total or average	16	--------	16	. 2	80
Other Caribbean:					
Bahamas	2	4	6	. 1	60
Barbados	15	7	22	. 2	110
Curaçao	5	(2)	5	. 1	50
Guadeloupe	14	(2)	14	. 3	47
Martinique	13	--------	13	. 3	43
Trinidad and Tobago	15	5	20	. 7	29
Other	--------	2	2	. 3	7
Total or average	64	18	82	2. 0	41

See footnotes at end of table.

TABLE 5.—*Estimated world milk production, by country, 1953*—Part II—Continued

Country	Cow's milk	Other milk	Total milk	Population	Production per capita
	Million pounds	*Million pounds*	*Million pounds*	*Millions*	*Pounds*
Other South America:					
British Guiana	21	3	24	0. 4	60
Surinam	8	--------	8	. 2	40
Total or average	29	3	32	. 6	53
Other Western Europe:					
Azores	165	4	169	. 5	338
Malta and Gozo	7	26	33	. 3	110
Trieste	15	2	17	. 3	57
Total or average	187	32	219	1. 1	199
Other Africa:					
British West Africa	9	4	13	2. 3	6
Eritrea	75	33	108	1. 0	108
French Equatorial Africa	110	28	138	7. 5	18
French Somaliland	5	30	35	. 1	350
Madeira Islands	80	(2)	80	. 1	800
Somaliland	360	(2)	360	1. 5	240
Spanish Africa [3]	170	163	333	1. 5	222
Sudan	1, 450	1, 250	2, 700	8. 8	307
Other	8	(2)	8	2. 1	4
Total or average	2, 267	1, 508	3, 775	24. 9	152
Other Middle East:					
Arabian states [4]	5	135	140	10. 0	14
Jordan	13	85	98	1. 3	75
Total or average	18	220	238	11. 3	21
Other Asia:					
Afghanistan	1, 325	3, 100	4, 425	12. 0	369
Bhutan	4	(2)	4	. 3	13
Burma	126	(2)	126	19. 0	7
China	239	55	294	463. 5	(5)
French India	4	(2)	4	. 3	13
Hong Kong	6	--------	6	2. 2	3
Korea	9	--------	9	19. 4	(5)
Nepal	80	(2)	80	7. 0	11
Portuguese Timor	7	(2)	7	. 5	14
Total or average	1, 800	3, 155	4, 955	524. 2	9

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[1] Less than 0.05 million. [2] Included in cow's milk. [3] Spanish Guinea, Spanish West Africa, and Moroccan Protectorate. [4] Aden, Al Kuwait, Oman, Saudi Arabia, and Yemen. [5] Less than 1 pound.

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